Teeth Whitening

Introduction

Being surrounded by pearly white Hollywood smiles everywhere, it's no wonder the market is flooded by teeth whitening products. As (future) dentists it's expected of us to be familiar with them. In this article, we go through some of the whitening products.

There is a variety of reasons why our teeth aren't as white as we would like them to be, though we can categorize them into two main groups. Intrinsic staining can be attributed to factors such as genetics, increasing age (enamel wears off over time and exposes underlying yellower dentin), antibiotics, fluorosis, developmental disorders and dental restorations. Extrinsic staining is mostly due to environmental factors including tobacco smoking, pigments in beverages and foods, antibiotics, and metals such as iron or copper. Before whitening it's important to identify the reason for staining and to record the shade with a shade guide and take picture so we can keep track. (1)

How does it work?

Tooth whitening is defined as any process that lightens the color of a tooth, which can be accomplished by removing the stain physically or a chemical reaction to lighten the tooth color. In this article, we are focusing on tooth bleaching which is a chemical degradation of the chromogens. The active ingredient in most whitening products is hydrogen peroxide (H2O2), often also in the form of other oxygen-releasing agents such as carbamide peroxide or sodium perborate. They break down in contact with water to release hydrogen peroxide. At-home systems usually contain 3-20% and in-office systems contain 15-43% peroxide. The whitening effect is due to products of breakdown of hydrogen peroxide, which react with the chromogens. Free-radical and redox reactions are responsible for splitting those long-chain organic molecules into smaller molecules which are usually lighter, resulting in lighter color of teeth. The final products of the reaction are carbon and water and are released together with nascent oxygen. Application of heat or light can accelerate the process, but they may also be harmful to the pulp. The longer the bleaching solution is kept on teeth, the stronger the whitening effect is. It also depends on the concentration of the bleaching materials; higher concentration produces a lighter effect. In case of higher concentration, bleach should be applied for a shorter time, otherwise it will dehydrate the tooth and cause sensitivity. (1,3)

Professional teeth whitening

Post endo tooth whitening

A discolored non-vital tooth in the esthetic region is always a challenge for the dentist in terms of deciding how to make it esthetically match the other teeth. Probably the most simple, safe, affordable and effective way is the walking bleach technique. It is indicated in cases when the tooth is discolored due to penetration of blood or products of degradation of the pulp or due to materials for root canal obturation. The first step is clinical and radiographic evaluation of the tooth. After isolating the tooth with a rubber dam, we remove the restoration from the palatal side and the first few millimeters of obturation material, just below the gingival margin. The next important step is to protect the bottom of the cavity and the cervical part of the canal with cement base, to prevent leakage of bleaching agents and to avoid external root resorption. Bleaching agent (35% hydrogen peroxide for example) is packed into the pulp chamber and sealed with temporary filling. After 3-5
Whitening at home

The terms “whitening” and “bleaching” are often used interchangeably, which can lead to confusion when interpreting the literature. According to the US Food and Drug Administration (FDA), whitening restores teeth to their natural tooth color, whereas bleaching makes teeth lighter than their natural color. However, the following products are better recognized by their commercial names as whitening trays/pens/strips instead of bleaching. Therefore, to avoid confusion, now that you know the difference we will proceed with referring to them by their commercial names.

Teeth Whitening Trays:

Home bleaching using trays involves going to the dentist, getting a set of custom-made trays for your teeth, and then applying the bleaching agent into those trays to whiten your teeth at home. It has the advantage of reducing clinical time by the dentist and it also has a relatively low cost. Yet, it also has drawbacks such as the treatment taking weeks, which is longer than some patients would prefer, and the responsibility of wearing the trays at home.

How is it done?

After an examination to make sure if this is a suitable method, pictures are taken and the dentist takes an (alginate) impression. A custom-made tray is made by a dental technician.

A recall visit will be done to try the tray after it has been made and the dentist will show how to apply the bleach into the tray and provide written instructions as the following:

*It is important to brush and floss before starting the home bleaching procedure.*

The Procedure: Open the syringe, and then apply it on the tray. Only a small amount should be applied to minimize the amount of excess bleach used. The bleach should only be placed on the outside surface of the tooth, and only on those teeth that you want to bleach. The tray is seated with the bleach on the inside, and the excess is removed with a wet tissue. Clean your tray well following each application with a brush and warm water.

Revisiting the dentist after 10 days to 2 weeks is very important for the follow up; to evaluate the treatment.

The most common side effects are tooth sensitivity and discomfort in the gums, which are reported by about half the people who completed home bleaching. Some even report improperly fitting bleaching trays. (5,6)

Teeth Whitening Pens:

Whitening pens are the right choice for the patients who are looking for quick and convenient teeth whitening. They are very simple to work with and some products claim to deliver results in just two days. After brushing the teeth thoroughly, gel from the pen is applied as a thin layer to each tooth’s surface, making sure that the entire surface is covered with the whitening gel. It’s important not to rinse, because the product needs to stay on the teeth for a certain amount of time in order for it to work; which depends on the brand, for the most of them it’s 20 to 30 minutes. (8)

Teeth Whitening strips:

Whitening strips are often preferred because of their convenience: they can be taken anywhere and need to be worn for only five to thirty minutes.

The stripes, which are coated with the bleaching agent, are simply applied over the top of teeth and the results can be seen in about seven days. Although whitening strips can brighten teeth, in some circumstances it’s not a solution for everyone. Like other bleaching methods, whitening strips will not alter the shade of dental restorations nor will they treat discoloration that is a result of tooth trauma, antibiotic use, tooth decay or imperfections in the enamel. As a normal part of the aging process our teeth can change color over time; surface stains can benefit from these whitening methods but only if the teeth and gums are in a healthy condition to begin with. (7)

Things To Be Aware Of When Using Whitening Strips

- Because strips do not cover the entire tooth surface you may experience uneven whitening.
- Bleaching agents could cause damage to gums; you may experience irritation, inflammation or discoloration of the soft tissue.
- Overuse can result in erosion of the tooth enamel and cause permanent tooth damage. Some will be more sensitive than others.
- Immediately after treatment you may see white spots appear on the surface. This is a result of dehydration of the tooth enamel. It’s not harmful and it will go away.
- You may experience excess saliva or foaming while wearing the whitening strips, this is a normal reaction to the peroxide coming in contact with your saliva.
Alternatives to teeth whitening

There are some other ways to achieve a brighter smile for those who don’t find any of the methods mentioned above suitable; useful also for those who already had their teeth whitened and want to keep them this way. First of all, good oral hygiene at home and regular visits to the dentist or dental hygienist for professional teeth cleaning, including removal of calculus and external staining, are a must. Secondly, don’t smoke and avoid food and drinks that cause teeth staining. Some of those are coffee, tea, berries, curry, red wine, beets, balsamic vinegar, tomato sauce and soda. Acidic food and drinks soften the enamel and make it more prone to staining. Using a straw is also a way to keep stain-causing dyes away from teeth. The last advice is mainly for the ladies – wear red lipstick. Opt for cool-toned red lipsticks with blue or purple undertones, which cancel out yellow hues on teeth. On the other hand, a less conservative method to having white teeth are veneers or crowns. They are recommended for discoloration caused by metal dental restoration, where bleaching isn’t effective, and for severe discolorations due to trauma, antibiotics and enamel imperfections. (2,3)

References:
3- https://pdfs.semanticscholar.org/16bc/0aab44fd7563d5c8e9a92d0b72ada111ddfd62b69dd.pdf
7- https://www.authoritydental.org/teeth-whitening-striped-work

Written by: Ziva Antolin, Silvi Domnori, Mohamed A.M. Ahmed
Proofread by: Silvi Domnori, Shukri M. Jama
Designed by: Abdelrahman Magdy